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Journal of the
**CALIFORNIA HISTORICAL
RADIO SOCIETY**



FOR THE RESTORATION AND PRESERVATION OF EARLY RADIO



FROM THE BIRTHPLACE OF BROADCASTING

CALIFORNIA HISTORICAL RADIO SOCIETY

HOME OF THE BAY AREA RADIO MUSEUM & HALL OF FAME

The California Historical Radio Society (CHRS), is a non-profit educational corporation chartered in the State of California. CHRS was formed in 1974 to promote the restoration and preservation of early radio and broadcasting. Our goal is to enable the exchange of ideas and information on the history of radio, particularly in the West, with emphasis on collecting, preserving, and displaying early equipment, literature, and programs. Yearly membership is \$30.



CHRS Museum at Historic KRE

CHRS is fortunate to occupy and restore the historic KRE radio station building located at 601 Ashby Avenue in Berkeley, CA. The KRE station an important landmark in S.F. Bay Area radio history. Originally constructed in 1937, the KRE station was one of the first facilities built in California specifically for broadcasting. The KRE site has been transmitting AM radio signals for over 70 years and still operates today as KVTO. In 1972, it was the location for scenes featuring "Wolfman Jack" and Richard Dreyfuss in the George Lucas film, "American Graffiti." The restoration of the station plus creation of a museum and educational center gives us an environment to share our knowledge and love of radio. It enables us to create an appreciation and understanding for a new generation of antique radio collectors and historians.



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From the Editor

This issue is long over due — the last CHRS journal was published in 2008. Having a journal is important. To get back on track, this issue was created expeditiously with very dedicated help. I want to thank the contributors including Mike Adams, Bart Lee, Thomas Bonomo, David Jackson, Dale Tucker, Richard Lane, Harry Bohl, Brian Forsberg, Gilles Vrignaud, and Steve Kushman.

This is the first issue printed in full color — a bit more costly but worth the improved readability and image clarity. I truly hope you enjoy these articles. The next issue is planned for fall. If you have comments, suggestions, or are interested in contributing to a future issue, please let me know.

Richard Watts, [jrchr@comcast.net](mailto:jrchrs@comcast.net)

From The President

by Steve Kushman

Welcome to this edition of the new CHRS Journal. For some of you, this is the first Journal you have seen. For others, we hope this Journal lives up to the high standards of past issues. We haven't seen a Journal for a while. For many years it was a regular publication and was one of the reasons that people joined CHRS. But times change and we have not been able to produce a Journal on a regular basis. So, we hope to make this Journal a regular publication again, starting with two issues this year. Thanks to all the contributors and especially to our temporary Editor Richard Watts. As Richard is already extremely busy with his other CHRS jobs, we hope someone will step up to become our regular Editor.

The California Historical Radio Society and its Bay Area Radio Museum (BARM) is one of the premier vintage radio societies in the world. That's a pretty bold statement, but we are confident that it's true. We are so much more than a radio collector's group. Yes, we have 7 swap meets per year, but we also have a giant fund raising event July 21st with a vintage radio auction, live music, a live radio play on stage with Foley sound effects, a huge electronic flea market, interviews with broadcast personalities and much more. If that isn't enough, we teach vintage radio repair, have radio repair clinics, teach broadcasting history and have an extensive research library with materials dating back before the turn of the 20th century. But wait, there's more! We operate amateur radio station W6CF, using a modern transceiver and two vintage tube rigs. And then, there is the CHRS Collection, one of the finest vintage radio collections around. The images on the front and back cover are from our collection. We have a working 1950s vintage radio control room and an audio transfer facility, where we can digitize Reel to Reel tape, cassettes, wire recordings, 8 tracks, 33s, 45s, 78s and ETs. Finally we operate and display the Bay Area Radio Hall of Fame. The Hall is housed in Studio 'A' of our CHRS / BARM headquarters in the KRE radio station building in Berkeley, built in 1937. We believe we are one of the only vintage radio societies to be housed in an historical radio station building. Soon we will be officially launching the fund raising campaign to purchase this historic building. Stay tuned.

For those in other radio collecting groups who may be reading this, these are the keys to our success. First we have a core group of members who are absolutely passionate about radio and radio preservation. Our volunteers tirelessly donate their time. Secondly, we have a physical space. Some of the activities we offer would be impossible without the proper facilities. And third, we have diversified. Radio collecting on it's own is rather one dimensional. Radios are only one part of a larger picture. If you look at 'radio', a new world will open up for your group. Yes, we may know the history of the radios we collect, but how about the history of the people on the radio and the history of the radio stations? Two years ago CHRS was fortunate to have the Bay Area Radio Museum and it's Hall of Fame merge with us. The BARM, in its online only form, brought to CHRS the thousands of audio clips and the bios and histories of our local radio personalities and the stations in which they worked. This merger has really revitalized our group and completes CHRS / BARM as an "all things radio" organization. Now we celebrate the technology of the radio, the personalities of radio and the history of our Bay Area radio stations. It has caused much new interest in our group by local broadcasters who have embraced CHRS / BARM.

It may be time for your group to reach out to your local broadcasting community. You will find that many of these people have great personal histories, interest in radio history and in the radios themselves. Perhaps your group can establish a local Radio Hall of Fame. Broadcasters always seem to have a box or two or more filled with audio tape of material that needs to be preserved and shared. Your vintage radio group's web site is the perfect way to do this and allows your group to branch out from radios, to radio...

Please enjoy this Journal and support the efforts of CHRS / BARM in the preservation of radio and radio history. Some of you who received this Journal have expired memberships. We hope that this edition will encourage you to renew your membership in our fine organization. Just go to www.CaliforniaHistoricalRadio.com to renew and donate with PayPal.

I am always available and appreciate your comments or questions. Contact me at kushseal@flash.net or (415) 821-7671.

Best Regards, Steve

◇

CHRS Sacramento Chapter News

by Dale Tucker

The Sacramento Chapter of CHRS is the successor to the Sacramento Antique Radio Club which was founded approximately 25 years ago. The Chapter currently has about 25 members who reside throughout the Sacramento region. Our stalwart member in Shingle Springs, Bob Moore, hosts a monthly meeting for members and is open to the public who may wish to find assistance in repairing/restoring their sets.

Each year we host swap meets. The first and largest is in early March at the local Sylvan Oaks Community Library in Citrus Heights. We often have a second swap meet during July or August. A year or so ago we were aided by a local TV Station sending their remote truck to our Summer meet for a live broadcast! Some 18 to 20 people showed up who'd just seen us on TV and came with questions, curiosity and more. The photos below are of our latest swap meet held March 3rd — a very nice turnout.

Come join us at our events – fans of classic radios are always welcome!

◇



CHRS Central Valley Chapter News

by Rich Lane

Annual Swap Meet and Vintage Electronics Sale – October 2011

The CHRS Central Valley Chapter 13th annual swap meet held at the Stanislaus County Fairgrounds on October 1st was a huge success. The Central Valley Chapter (CVC) put much effort into advertising the event and drawing several hundred from as far as the Bay Area, Sacramento, Bakersfield and Fresno and a wide variety of sellers. A highlight of the meet was the raffle of 10 items donated by the club members; the grand prize being a 1937 General Electric multi-band console radio that had been fully restored. Our goal as always was to bring together fellow hobbyists and have fun; from the feedback we believe that goal achieved.



Turlock Historical Society Museum Display

For several months in 2011, the CHRS Central Valley Chapter was invited to display antique radios and wireless devices, pictures, and ephemera at the Turlock Historical Society Museum. The items were borrowed from member collections. The display was well received by the museum and community, and featured in an article in the Turlock Journal newspaper. The news article and other photos are on the CVC website.



Annual Christmas Potluck Dinner

The chapter members had a great time at the Annual Christmas Potluck Dinner on December 17th, 2011. Chapter Chairman, Eddie Enrique, who is very active in historic aviation and a member of the Central California Valley Squadron of the Commemorative Air Force, arranged for us to use their large hanger for the event. On display were vintage planes and interesting aviation memorabilia.



2011 "My Favorite Radio" Contest

In May, the "My Favorite Radio Contest", a radio restoration contest was initiated attracting six entrants who had to complete their projects and submit them for final judging in November. The radios were judged initially with the worst receiving the higher score; then judged again in November for the quality of restoration of the cabinet, electronics, and performance; beginning and end scores were then combined. Winners were announced and awards presented at our Annual Christmas Potluck Dinner.



1st Place Best Chassis 2nd Place 3rd Place
Ron Vikjord Wayne Light Scott Scheidt Matt Thompson

Class Offerings in Fourth Year

The CVC currently offers three classes that have proven to be very popular:

- Basic electronics and radio theory: This currently meets weekly on Thursday evenings over a several month period; the instructor is Larry Gonsalves.
- Radio electronics repair workshop: This currently meets weekly on Wednesday evenings for members with more advanced knowledge to work on their projects and receive guidance as needed; this currently led by John Wallin.
- Cabinet restoration workshop: This occurs monthly prior to chapter meetings, attendance is ad-hoc based on requests or need; this is led by Jim Silva.

CVC Website is in its Second Year

The Central Valley Chapter launched its website in November 2010. Site-master Scott Scheidt has done an excellent job featuring the various aspects and activities of CVC, the services offered through the members, and restoration and preservation information. Please visit the CVC website at www.cvantiqueradio.com. ◇

Lee de Forest, King of Radio, Television, and Film

by Mike Adams

Our Mike Adams has recently published another book, this time about the famous Lee de Forest. In this article, Mike presents insights based on extensive research about this important man and his key contributions toward the progress and development of radio, television, and film technology. — Editor



Who was Lee de Forest? What was his most significant contribution to electronics? And was he really the “King” of all media?

Lee de Forest was highly educated in all the known theories and practices of what was the nascent science of electronics in the late 19th Century. After he received his Ph.D. in physics and electricity from Yale University in 1899, he spent the next 30 years turning the science he learned there into the popular media of the 20th Century. First he added sound to the coded wireless telegraph of Marconi and created a radiotelephone system. Next, he turned to the diode vacuum tube detector circuit of Fleming and modified it to make possible the detection and amplification of audio. Finally, he took the silent film of Edison and added a reliable synchronized sound track, and practical talking pictures were born. In all this, the major contribution of de Forest was the three-element vacuum tube that allowed amplification of sound through loudspeakers for radio and the movies, and later television, which helped create their large public audiences.

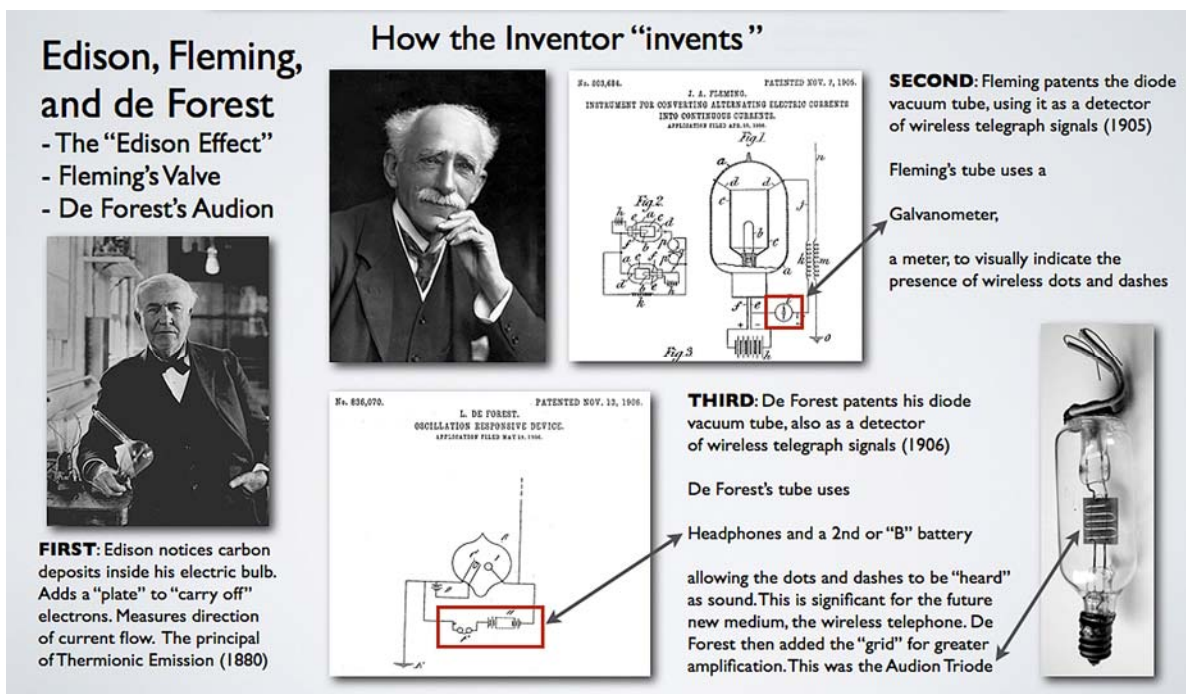


Figure 1

For an example of how de Forest the inventor worked, look at the images in Figure 1. First, in 1880 Thomas Edison discovers a blackening on the inside of his light bulb which gradually causes the light to grow dim. He adds a plate to draw the electrons emitted by the filament, and unknowingly discovers thermionic emission. He patents it as the “Edison Effect.” He saw no practical application for it and put it aside. Years later Ambrose Fleming patents a diode rectifier as a wireless detector. He is working for Marconi and he shows it in the patent drawing with a galvanometer to visually indicate the presence of code. A year later de Forest improves upon the Fleming patent by adding a battery (called the “B” battery) and earphone in order to “hear” the code. His improvement to the Fleming Valve is enough to gain a patent. A year after that he adds the third element, the grid, and patents that improvement. There are those who say that de Forest “stole” the tube from Fleming, but the evidence suggests he carefully examined the Fleming patent and saw a way to improve it enough to get his own unique although similar patent.

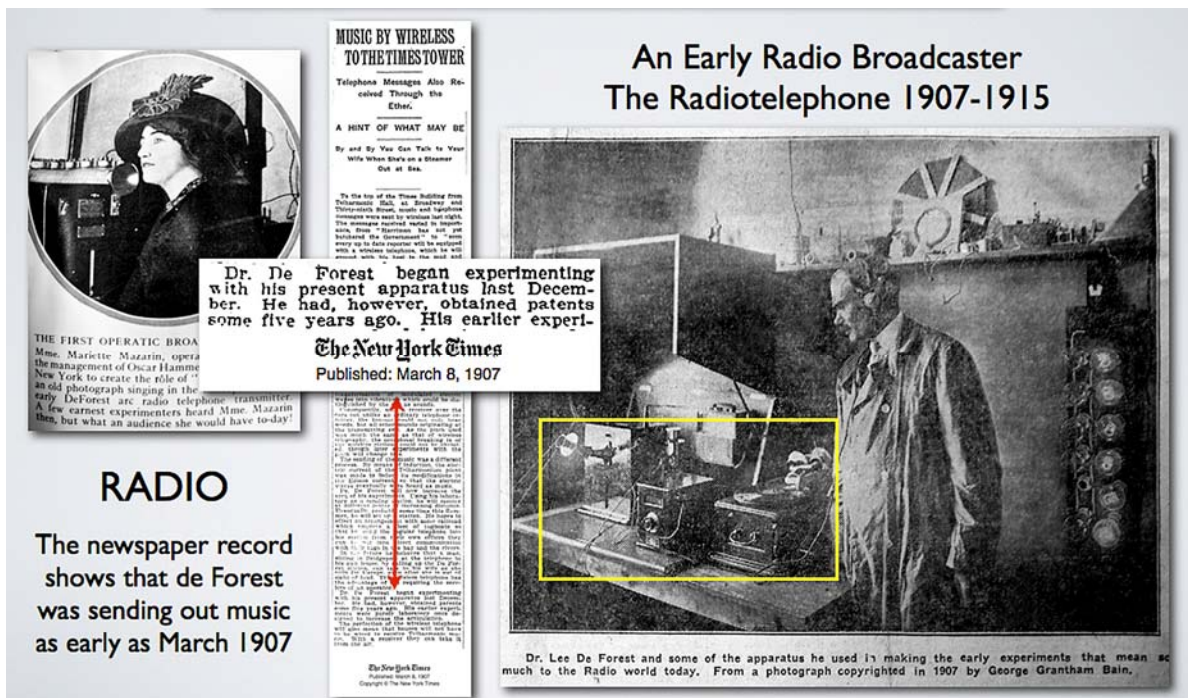


Figure 2

The result of this seemingly small technical change from “seeing” code using a meter to “hearing” it using an earphone was just what de Forest needed to develop a system of transmitting and receiving using voice instead of code. His addition of the “B” Battery and earphone would allow voice and music to be received and heard. And although his voice transmitter was a variation of a Poulsen arc, it was how he used it that was significant. In Figure 2 there is a New York Times account of a March 8, 1907 transmission of music by de Forest, and in that article he is quoted as saying that he had developed the system of radiotelephone transmission in December 1906. The importance of this date is that it was Reginald Fessenden who claimed he broadcast a program of music on Christmas Eve 1906, but unlike the de Forest story reported in the Times, there was no mention of the Fessenden broadcast until decades later in 1929. So it may have happened but there was no credible evidence. De Forest did broadcast several publicized programs of music beginning in 1907, most recorded in the newspapers of the day. He started several pre-1920 radio stations, one in 1916 in New York City, and one in San Francisco at the California Theatre. So maybe it can be admitted that he was the “King” of radio.

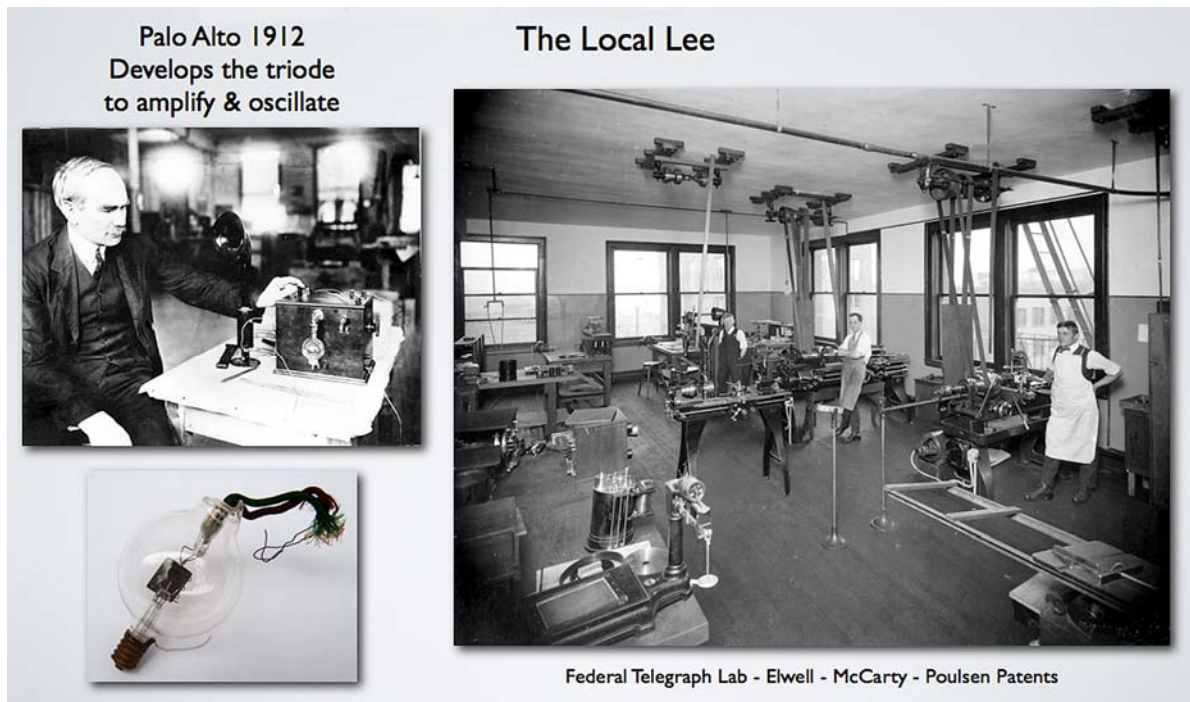


Figure 3

There is also the Bay Area Lee de Forest. By 1912 he was out of money and facing legal action as a result of his mismanaged wireless company and its exaggeration over the value of the yet-to-be-proven Audion. He was offered a job and laboratory space by Cyril Elwell of Federal Telegraph. There, he began to develop his signature invention, the vacuum tube, into a transmitter and an amplifier of sound. This important work took place at one of the first Silicon Valley startups, funded then by a group of Stanford professors. In addition to de Forest, Federal also employed Douglas Perham whose technology collection is housed at History San Jose. That organization has just received a large grant with which to catalogue and make accessible to researchers and the public the de Forest and Perham collections.

But what about film? The record is clear. Beginning in 1918 de Forest had made preliminary drawings and filed a patent for his sound-on-film system. And like his previous inventions, he looked at what similar devices has come before, and attempted to improve upon them in a way that would allow him a solid patent. He looked at the early Edison attempts to synchronize the silent film with a phonograph, and he looked at the early “writing with light” experiments of Bell, Ruhmer and Lauste. The phonograph would never satisfactorily synchronize, and its playing time of a side was only several minutes, too short for even the “one reeler” film of ten minutes. In the early sound-on-film experiments and patents, the microphones used to record the sound were those of the carbon telephone, never good enough for the frequencies of the voice. And the selenium cell used to pick up the recorded sound was barely sensitive enough for playback using headphones. He knew exactly what the problems were and set out to solve them.

By the early 1920s he had made a number of short movies, mostly one-shot unedited recordings of the vaudeville and musical acts of the day. These he screened in theatres as “short subjects” to accompany the silent feature. His Audion tube was the key as it allowed playback of sound over loudspeakers which made it possible for mid-1920s audiences to experience talking pictures for the first time. For this de Forest received an Oscar in 1960. That might be enough to qualify him as a “king” among kings in film.

Lee de Forest identifies the sound-on-film problems

The carbon telephone microphone for recording



Headphones for listening



Pre-de Forest sound films used the phonograph or a selenium cell and headphones

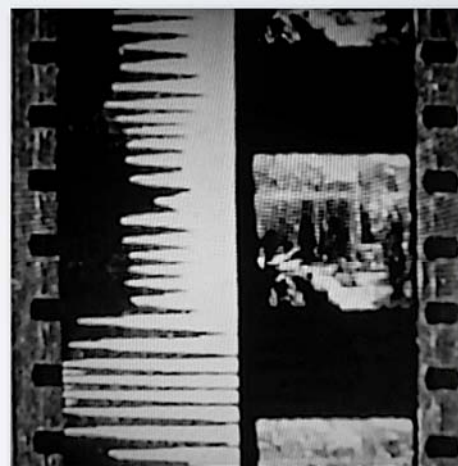
Figure 4

Unlike his major successes in radio and film, his early ideas about television technology were not fully formed. He told the *Los Angeles Herald* in 1923: "Moving pictures can be sent by radio just as still photographs are now sent. But it will be many years - I'm not afraid to predict centuries - before radio movies will be practical. Modern science today is absolutely in the dark as to any discovery which would make the broadcasting of motion pictures anything as practical as the broadcasting of sounds." He could only visualize television as an extension of radio and the movies: "Broadcasting moving pictures by radio will be impossible during this generation due to prohibitive costs and other impractical considerations." He understood bandwidth, a problem faced by Francis Jenkins, inventor of the 1925 spinning disc "Radiovisor" television. De Forest himself filed several 1931 patents for the soon-to-be-doomed mechanical television, crude pictures limited to 40 or 50 lines, and broadcast using AM short waves.

Figure 5

Lee de Forest identifies the sound-on-film problems

Edison and Dickson experiment 1894

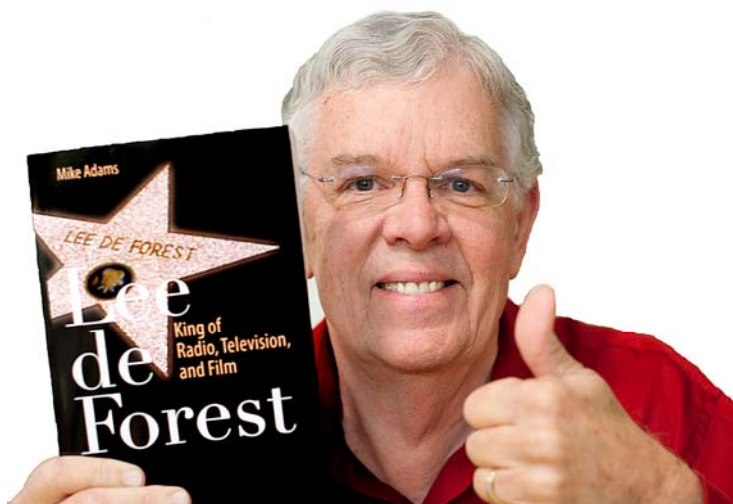


Eugene Lauste 1912

Pre-de Forest sound films used the phonograph or a selenium cell and headphones

In 1945 de Forest applied for a patent for a mechanical color television adapter which he believed superior to the CBS color wheel: "I place before any kinescope face, even of a 16 inch diameter, a three-color mosaic screen. It oscillates in an orbital, circular movement." He also received a patent for a videotape recorder, likely similar enough to the Ampex Quad system of 1956 to lose any patent challenge. But you have to love this head scratcher, a 1957 article in the *Los Angeles Examiner* headlined: "De Forest Files for Patent on 4-Inch Thick Wall TV Set." You may be saying to yourself, "Well I have one of those," but in 1957 even the smallest television set was several feet thick. According to the inventor: "The new flat set he said as he worked through his birthday in his office on Highland Ave is made possible by the use of printed circuitry to condense the bulky TV tube into a flat picture-like package."

As to the question: "Was de Forest really the King of Radio, TV, and Film," the answer here is that if my publisher says it is so, who am I to argue. In my agreement with the very capable folk at Springer Science, they designed the attractive cover, and they had the right to title the book. I do like their title, even though I'll admit I have heard from those who question giving de Forest all that royal credit. I am reminded that years ago DJ Howard Stern claimed the title, "King of all media." I rest my case. ◇



Mike Adams is the Board Chair of the California Historical Radio Society. As a member he has received the Herrold Award, and the title of "Fellow in History." He received the Houck Award from the Antique Wireless Association, and was recently inducted into the Bay Area Radio Hall of Fame. He is a long-time creator of television about the history of radio, the Emmy-nominated PBS series "Radio Collector," and "Broadcasting's Forgotten Father, the Charles Herrold Story." He is the author of five books.

Adams has long been familiar with the large de Forest collection now at History San Jose. In 1988 Adams was on the board of the Perham Foundation and its de Forest collection was then at Foothill College. When the College evicted Perham, the collections were put into storage, later to be transferred to History San Jose. Beginning in 2005 Adams began to regularly visit the de Forest archives and scan and photograph the collection. He started the de Forest Web www.leedeforest.org in the mid-1990s and wrote the de Forest biography, *Lee de Forest, King of Radio, Television, and Film*, Springer Science, NY, 2012. Adams is a professor of radio, television, and film at San Jose State University where he has been a department chair and an associate dean. His email is: mike.adams@sjsu.edu ◇

The San Francisco Amateur Radio Club: The First Three Decades 1909-1927

An excerpt from a presentation by Bart Lee, K6VK, to the Club, copyright Bart Lee, 2012

As early as 1903, young men in San Francisco followed commercial work in the Radio Art with their own wireless telegraphy transmitters and receivers, spark coils and carbon rod detectors. By 1909, in San Francisco and elsewhere, men and boys formed clubs to work with like-minded “wireless telegraphy” experimenters. Their object was to communicate over the air — the “ether” it was called, and they did, sometimes to the annoyance of the Navy and others.

The first U.S. wireless receiving station was located in San Francisco’s Cliff House in 1899. On August 23, 1899 at about 5pm, America’s first transmission was made from Lightship 70 to the Cliff House by spark and coherer signaling “Sherman is sighted” announcing the eminent arrival of returning troops from the Spanish American War on the *USS Sherman*. According to an August 26, 1899, *San Francisco Call* newspaper article, local and nationwide enthusiasm ensued.



The early 1900’s witnessed great progress in wireless by the Navy and commercial developments; there was also strong local activity in the San Francisco area:

- Marconi telegraphs across the Atlantic, 1901.
- McCarty in San Francisco makes a “wireless telephone” in 1902.
- Navy stations operate in the Bay Area from 1904.
- Lee de Forest puts the “PH” wireless station in the Palace Hotel, 1904.
- Cyril Elwell works with an arc transmitter, 1907.
- Maritime stations in SF from 1907 – *e.g.*, Massie.
- Great White Fleet visits SF 1908 – wireless music.
- “Doc” Herrold in 1909 in San Jose experiments with modulating a spark transmitter, and by 1912 with an arc, was routinely broadcasting music.

According to a 1909 *S.F. Call* Newspaper article, San Francisco’s “Youthful Wireless Operators,” there were 200 to 300 amateurs in San Francisco.

The San Francisco Radio Club formed in 1909; it and the MIT amateur radio club, also formed in 1909, are the oldest in the nation. Henry W. Dickow, later Editor of *Pacific Radio News* and W6JYN, helped put the Club together in 1909 as a 12 year old boy; the President was R.E Crowden. In 1917 Dickow wrote: “In former years there flourished a radio organization ... known as the San Francisco Radio Club, having a membership of about fifteen operators. This club was organized before the U.S. Government laws went into effect and disbanded shortly after... twelve [of the 15] successfully passed the ...Commercial First Grade examination.” In 1917 Crowden, then a Marconi operator, noted that several of the original members participated in the revived San Francisco Radio Club.

The earliest San Francisco callsigns were initiated by wireless clubs who assigned their own member callsigns *circa* 1909. The Bay Counties Wireless Club used S as a prefix; Ray Newby was SEW, after using the self-assigned call EZM. The San Francisco Radio Club saw fewer than 26 eligible amateurs in the City at the time; it used the prefix RS for *Radio San Francisco*, and then letters A through Z, e.g., RSC. Bill Larzelere and Ed Stevens were two of the first amateur wireless operators in San Francisco.

In 1912, amateur radio was challenged. To eliminate conflict between amateur stations and maritime communications, the US Secretary of Commerce and Labor relegated amateur radio to wavelengths “200 meters and down”; *i.e.*, 1,500 KHz and up. This was thought to be a wasteland; most maritime stations worked on 600 or 800 meter wavelengths (500 – 800 KHz) and amateur wireless stations did the same – often annoyingly. The 1912 restriction would be like a law today that amateur radio could only use frequencies of five gigahertz (5 GHz) and above. Many (most) amateur wireless operators turned away once they were restricted to shorter wavelengths. For example, M.H. Dodd, in Nevada, closed his station and sealed it up in 1913, as a result of the wavelength restriction.



State of the amateur wireless art, 1911
-1912, in operation by M. H. Dodd



The 1912 station today

Photos and artifacts preserved at
the Western Historic Radio
Museum, Virginia City, Nevada.

Photographs by and Copyright
Henry Rogers, All Rights Reserved.

Between 1913 and 1917 amateur radio again flourished. The San Francisco Radio Club reinstituted itself in January, 1916. The club publishes a “Yearbook” in 1916 (with 36 members) and *Pacific Radio News*, starting in January, 1917 (Vol. 1, No. 1). Henry W. Dickow (6HD) was the principal of the Club and the magazine – he went on to a distinguished career and the magazine became *Radio*. Dickow was not above doggerel:



Henry Dickow in 1924

*“The San Francisco Radio Club;
Its members tried and true,
Will furnish all the latest news,
That may appeal to you.”*



The San Francisco Radio Club flourished in 1916 and 1917. According to Dickow (1917), it had nearly 100 members. Many members were employed by commercial wireless corporations. Members had to pass an examination equivalent to the U.S. First Grade Commercial examination. Interference was avoided by use of the Club's measuring instruments [wavemeters and the like]. Prominent speakers addressed the Club and the Club printed the lectures. The club's Initiation fee was \$1 and monthly dues 25 cents totaling \$3/yr which equals \$50 today. The club maintained a club room at the corner of Frederick and Belvedere Streets.

There was official praise for the club. Radio Inspector Lt. Ellery Stone notes that only the San Francisco Radio Club and the Institute of Radio Engineers in New York had published Yearbooks. According to Dickow (1917) "The task of tuning stations to resonance has met with great approval by the local Radio Inspectors...". U.S. Radio Engineer V. Ford Greaves wrote: "I ... desire to congratulate you and the members of your club on your excellent organization...."

The club officers in 1917 were:

- H. W. Dickow, President (6HD in 1913)
- D. B. McGown, Vice-President – later in 1921, Assistant Radio Inspector
- H. R. Lee, Secretary - Treasurer
- T. J. Ryan, Sergeant-at-Arms – later in 1919 also a Club Officer
- H. J. Malarin, Examining Officer – He was later a radio dealer in 1921. Laurence Malari ("LM") was the legendary manager of United Wireless and American Marconi in San Francisco (later RCA).
- C. M. Heaney, Examining Officer

World War I – "The War to End All Wars." In April, 1917, the Government shut down *all* radio stations, receiving as well as transmitting; *all* antennas had to come down. The San Francisco Radio Club held itself together under the leadership of F.K. Teeter, Jr. with only four active members. Many amateurs enlisted in the Armed Services. Most amateur wireless clubs and all stations went inactive for the duration.

After Victory in November, 1918, Amateurs looked to getting back on the air, especially with the newly available vacuum tubes. The Navy, however, wanted to maintain its wartime total control. Commercial interests won out, also liberating amateur radio from Navy suppression.

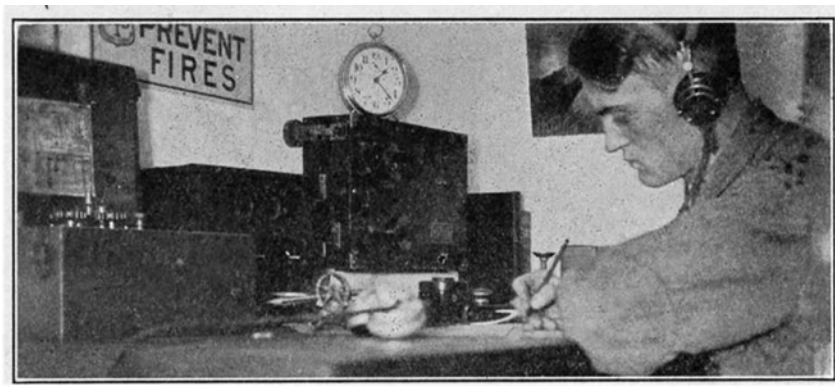
The San Francisco Radio Club revived after World War One. The Club's purposes in 1919 were:

- To promote among its members the practice of, and interest in Radio Communication;
- To advance the science of Radio Communication among its members;
- To have club rooms and halls for its members;
- To construct and maintain for the educational advancement of its members Radio apparatus and equipment;
- To conduct lectures and demonstrations and give courses in Radio Communication and construction of apparatus;
- To hold social functions;
- To acquire a library and current periodical literature on the science of Radio Communication.

The Incorporating Amateurs in 1919 were:

- Adolph W. Honing, 516 7th Avenue
- William Joseph Henry, 554 11th Avenue
- Francis K. Teeter, Jr., 365A 11th Avenue (who had kept the Club alive during the war)
- Eugene L. Chaix, 2056 Bush Street
- Thomas J. Ryan, 349 7th Avenue (a 1917 officer)

By 1921, Francis K. Teeter, Jr. had pioneered use of radio by the U.S. Forest Service, calling on amateur operators to sign on and using World War One radio equipment from the Army Air Service for both air and ground operation. From *Pacific Radio News*, Oct. 1921, p. 98.



Francis K. Teeter, Jr.

The state of the art home-brew equipment in those days: A Vacuum Tube Transmitter circa 1921 putting out 20 Watts, CW & Phone, and, like much else amateur, Do-It-Yourself

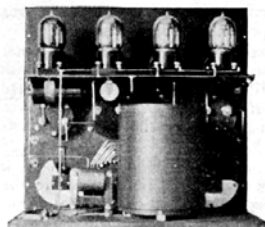
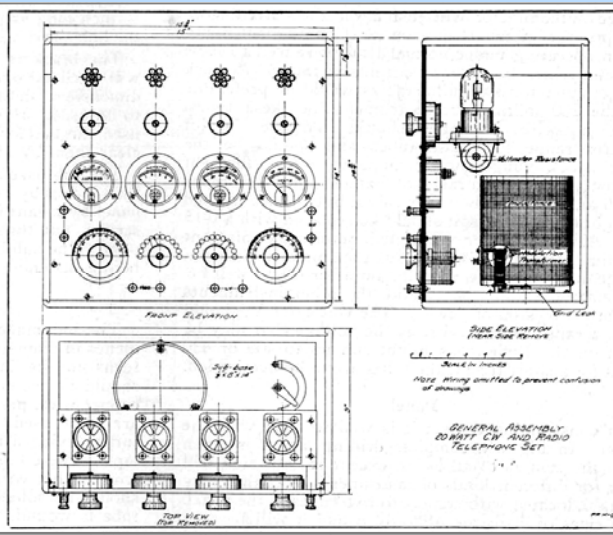


Fig. 1 (Above) Rear view of panel.

Fig. 2 (To Right) General Assembly Drawing. The arrangement of the various pieces of apparatus required in the construction of a highly efficient C.W. transmitter must be compact. Short connecting leads are essential. But compactness must not give way to efficiency. The general arrangement of mounting the apparatus shown on the panel in illustration is an excellent one. Care must be exercised in wiring the transmitter in such a manner that the high tension leads will not interfere with those carrying the low tension current. Nickel plated hard-drawn copper wire is well adapted for the bug-bar type of connections. Rounded corners and firmly soldered connections will not only add to the appearance of the wiring, but will prevent loss from leakage. All connections terminating into binding posts should be soldered. Do not depend on screw-and-nut connections. They will often work loose.



The 1921-'22 club officer nominations were:

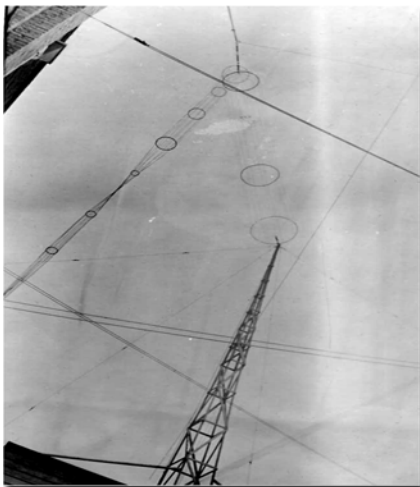
- President: H.W. Dodge, H.W. Dickow, E. Schivo
- Vice-President: C. Thompson, M. Heeder, S. Fass*
- Secretary: H.W. Dodge, E. Schivo
- Treasurer: S. Schomaker
- Sergeant at Arms: M. Heeder, E.S. Peterson

* Sydney J. Fass, active since 1909, had been a seagoing and shoreside wireless operator and established one of the largest radio and electronics retailers in San Francisco in the 1950s.

1922 State-of-the-Art Stations; all photos come from a photo album of C. West (5CN) Vancouver, B.C., Canada (in the author's collection – it seems that some amateurs enjoyed trading station photos):



7NJ, Washington State

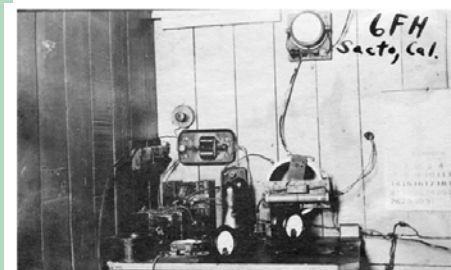
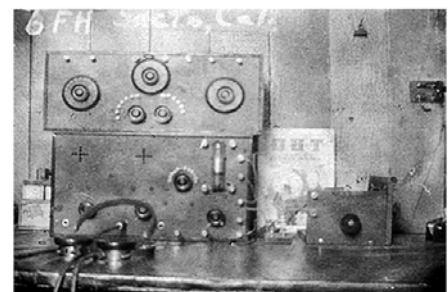
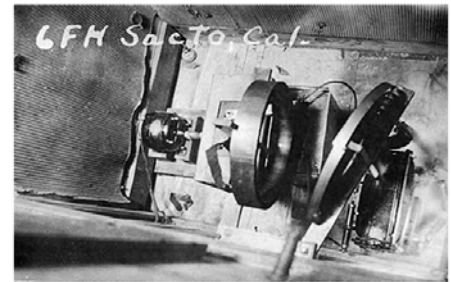


Left: Cage Antennas & Tower at 6AWT. Bart Molinari, of San Francisco, was the ARRL 1924 Hoover Cup Winner for Best Amateur Station in the United States – 6AWT, 1923 San Francisco, Ca. In 1927, Philo Farnsworth, the San Francisco inventor of electronic television, employed Bart Molinari as his Chief Engineer at his Green Street Laboratory.



6UO Nevada. Note DeForest Interpanel modular receiver and Western Electric audio amplifier for horn speaker, as well as typewriter for "traffic" and tube transmitter in Bill Heade's station in Yerington, Nevada.

6FH Transmitter & Receiver—note transmitter tuning inductances and the one tubular Audion (regenerative) receiver.





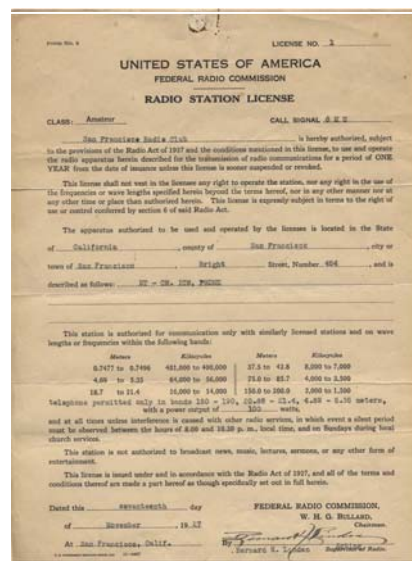
The 1924 Pacific Radio Exposition looked back at the San Francisco Radio Club: “Radio amateurs of San Francisco have long been banded together in an organization known as the San Francisco Radio Club, Inc. The club is one of the oldest and largest of its kind in America, having been founded in 1911 [sic].” ... “The first radio show held in San Francisco, a number of years ago, was entirely conducted by the San Francisco Radio Club.”

Before 1927, the U.S. Department of Commerce asserted jurisdiction over the ether and issued station licenses. The then-new Federal Radio Commission assumed jurisdiction in 1927. The San Francisco Radio Club applied early for a license from the FRC, for itself as a club. It got the very first one issued. The FRC issued 6MU as the callsign for the new club station. It was located at 454 Bright Street, in San Francisco. The license provides for:

- Power Authorized: 100 Watts.
- Bands Authorized: 70 cm (400+ MHz), 5 meters (56 MHz), 15 meters, 40 meters, 80 meters & 160 meters (1,500 KHz to 2 MHz).
- Phone operation only in 70 cm, 15 meters & 160 meters.
- Term of license: one year.
- Silent Hours, 8 PM to 10:30 PM if interfering.
- No news, music, lectures, sermons or entertainment.

Radio advanced into a new regulatory era with the Radio Act of 1927; The Federal Radio Commission (later the FCC) was established, frequencies were reallocated, and operating licenses were required. An image of the 1927 license of the San Francisco Radio Club, callsign 6MU, is to the right: The first license issued by the Federal Radio Commission, Bernard Linden, San Francisco Radio Inspector, November 17, 1927.

The first three decades of the San Francisco Radio Club laid a solid foundation for the next seven. In the 1930s it did slow during the Depression. It participated in the Amateur Radio Emergency Corps before World War Two. (It held and filmed summer Field Day exercises in 1940, 1941 and in 1948 and thereafter). During that war, many of its members served in the armed forces. San Francisco amateurs also participated in the War Emergency Radio Service (WERS) on 2&1/2 meters, 110 MHz. In the 1957, it adopted the callsign of an early member, John L. Stevens, as its club station callsign W6PW. In the 1980s it changed its name to the San Francisco Amateur Radio Club. It continues as an active social and technical society of amateur radio operators, sponsoring community service, emergency preparedness, monthly meetings, holiday get-togethers, Field Day annually, and W6PW. W6PW is now its 2 meter repeater callsign and the callsign of its station in the Veterans' Administration Hospital in San Francisco (where the club meets). Its website is: <http://www.sfarc.org>.



Further information about the club's history is welcome. 73 de Bart Lee, K6VK, Fellow of the California Historical Radio Society in History. Copyright Bart Lee, 2012. ♦

The Collection of Harry Bohl

By Richard Watts

Harry Bohl of Turlock is a CHRS Life member and very active in the CHRS Central Valley Chapter. Harry's collection came primarily from his father, Leslie. His interest in vintage radio came about in part in working through the items in his dad's collection when they moved from their Manteca farm in 2004. As Harry researched the items, he became increasingly fascinated with the many unique items and developed an appreciation of his truly special collection. In addition to vintage radio and wireless items, Harry also collects period items in photography and toys. Leslie Bohl currently lives in Manteca.

About the collection

Leslie Bohl did the majority of his collecting in the 1960's and in to the 1970's while living in the Bay Area. In 1975, he moved the family to Manteca and switched from teaching high school to farming. After this switch, his pursuit of acquiring items and expanding his collection diminished but he continued to care for and protect the extensive collection that he had accumulated.



Leslie acquired a number of items which had been in the Harold S. Greenwood collection. Mr. Greenwood was a noted collector of early wireless and radio. He authored *A Pictorial Album of Wireless and Radio (1905-1928)* which was the collector's bible at the time; Morgan E. McMahon continued to revise this material in his book *Vintage Radio 1887-1929*. In a 1978 talk by Paul Giganti (reprinted in *Antique Radio Classified*), Paul said that he, along with fellow collector, Bill Traver, acquired the Greenwood collection in the 1960s for \$3000, which averaged \$10 per item — imagine. Paul kept many of the items and sold or dispersed others. Harry remembers his dad interacting often with Paul. Through Paul, he acquired many items from the Greenwood collection, some still retaining Greenwood identification stickers. A few of these items appear in Greenwood's book as evidenced by unique markings or handwriting on labels that have exactly the markings as in the book.



Crosley Pup; 1922 — in mint condition — The CHRS mascot

Many items are from local Bay Area manufacturers including: Lemco, Magnavox, Stoneburner & Son, Radio Equipment Co., and Colin B. Kennedy. Even though Harry has items from all periods of vintage radio, the primary focus of this article will be on those prior to the mid 1920's.

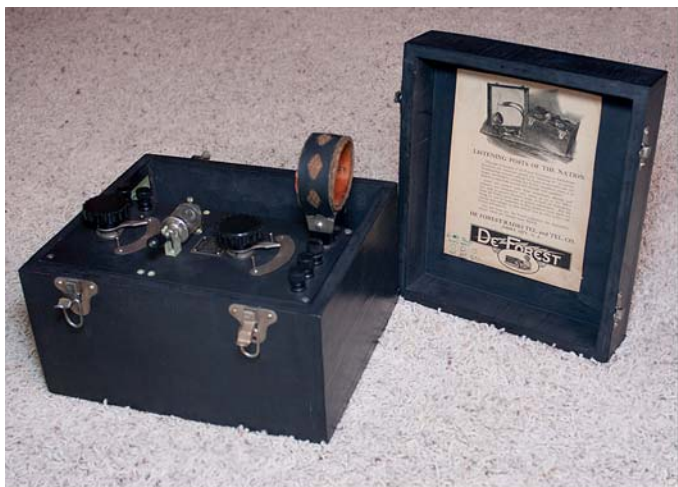
Now on to highlights of his collection ...



A.C. Dayton XL5; 1925 — Under a camera collection



Left: Alden Speaker (paper speaker); Alden Mfg Co, Springfield, MO
Right: Loewe's Radio; 1926; Loewe Radio Co., Ltd., Great Britain
Uses a 3NF tube — three complete tubes in one envelope



De Forest Everyman DT-600; 1923

This very set and several others in this collection appear in Harold Greenwood's book *Pictorial Album of Wireless and Radio (1905-1928)*



Magnavox Type A32 Model 3 Audio Amplifier; early 1920s
Mfr: Magnavox Co., San Francisco / Oakland, CA



Left: Westinghouse Aeriola Jr.; 1922

Right: Westinghouse Canadian Aeriola Sr.; 1921/1922



Left: Westinghouse Aeriola Sr Amplifier.; 1922

Right: Westinghouse Aeriola Sr.; 1921/1922



Left: Reco; Mfr: Radio Equipment Co., San Francisco, CA

Right: Crain Craft; the "Ford of Radio"
Mfr: CM Stoneburner & Son, Oakland, CA



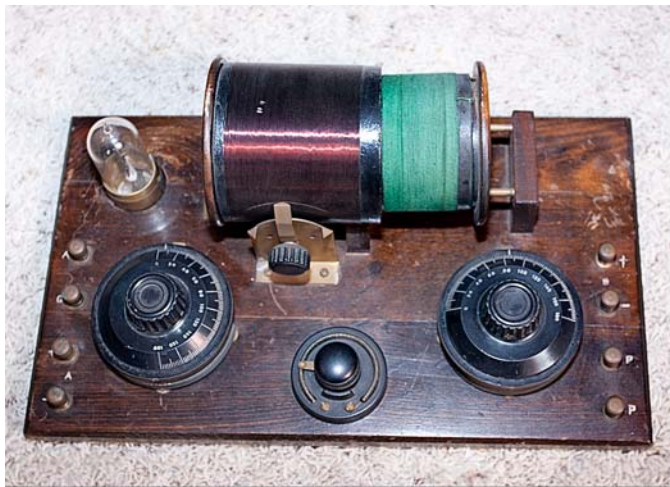
Lemco Crystal Sets — 1922-1924

Mfr: Lee Electric & Mfg Co, San Francisco, CA

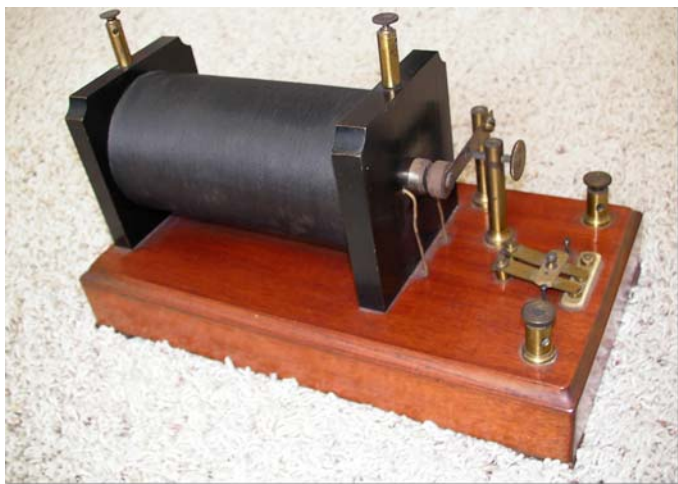
Left: Model 340B; Center: Model 450; Right: Model 340A



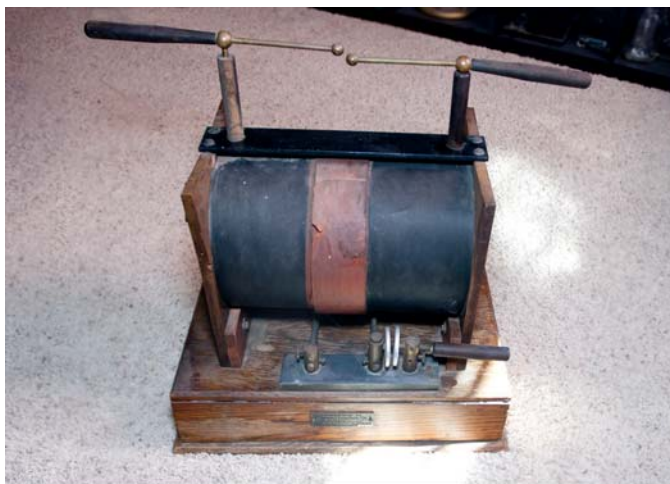
Atwater Kent breadboards; 1923
Top: No. 12; Bottom: No. 10A Two of several in the collection.
Harry says there are only three models he doesn't have



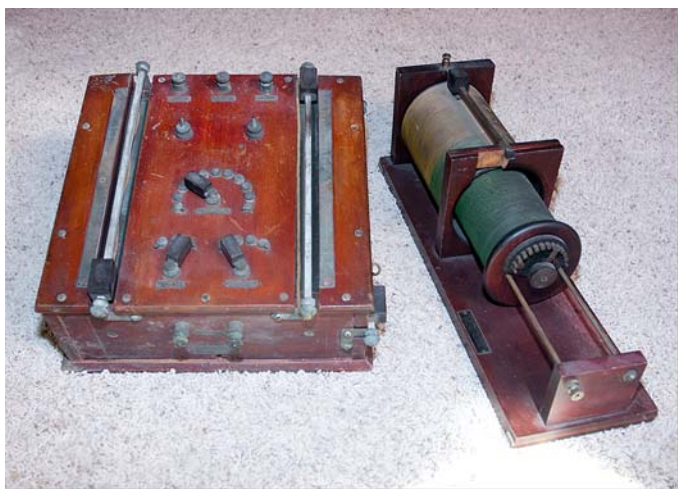
Breadboard receiver — circa 1919 per date underside
Mfr unknown; mfr plate from upper corner is missing
If someone can identify this, please let me know



Ruhmkorff Coil — The type used in 19th century labs to get a high voltage spark for demonstrations. A larger version was used in the 1899 spark transmission from Lightship 70 to the Cliff House



Spark amateur/experimenter transmitter inductance coil with a spark gap on top. Circa 1912
Mfr: Heinze Electric Co, Boston, MA



Left: Type D Tuner; 1907-1912
Mfr: United Wireless Telegraph Co.
Right: Marconi Loose Coupler Tuner; circa 1916



Loose Coupler Inductors — circa 1915
Left: Wm J Murdock, Chelsea, MA
Top: Clapp Eastman, Cambridge, MA; Center: unknown



- | | | | |
|----------------------------------|---------------------------|-----------------------------------|----------------------------------|
| 1. General Electric experimental | 6. Weagant external grid? | 11. Audion | 16. Japanese |
| 2. Edison light bulb | 7. Marconi | 12. Myers | 17. Japanese |
| 3. Fleming Oscillation Valve | 8. OSRAM screen grid | 13. General Electric experimental | 18. Volutron 201 |
| 4. Marconi valve | 9. De Forest | 14. GE experimental—CA Pliotron | 19. Delux D2 |
| 5. General Electric experimental | 10. R-4 OSRAM? | 15. French TM? | 20. Marconi? DeForest? Moorhead? |

G.E. experimental tubes 1, 5 & 14 bare the name Dr. Lanmuir which may be Dr. Irving Langmuir a principle scientist at GE Research (1909-1950). He advanced fields of physics and chemistry, invented the gas-filled incandescent lamp, the hydrogen welding technique, and was awarded the 1932 Nobel Prize in Chemistry for his work in surface chemistry. Dr. Langmuir was president of the Institute of Radio Engineers in 1923. He developed Pliotrons, first true high vacuum triode in 1915 and found that a harder vacuum would improve the amplifying behavior of the triode.



Crystal Detectors

- | | | |
|---|--------------------------------|---|
| 1. Clapp-Eastman Ferron Det.; marble base | 7. Unknown mfr | 13. Carburnundum stabilizing fixed detector |
| 2. Perikon detector; Wireless Specialty Apparatus | 8. Unknown mfr; 1923 | 14. Grewol |
| 3. Perikon detector; Mesco | 9. Freshman | 15. Fada? |
| 4. Unknown mfr | 10. Eico electrolytic detector | 16. Triple det; Lowenstein/US Navy SE 183A |
| 5. Unknown mfr; double detector on marble base | 11. Eico | 17. Perikon detector; Unknown mfr |
| 6. Unknown mfr | 12. Pacent | 18. Fada |



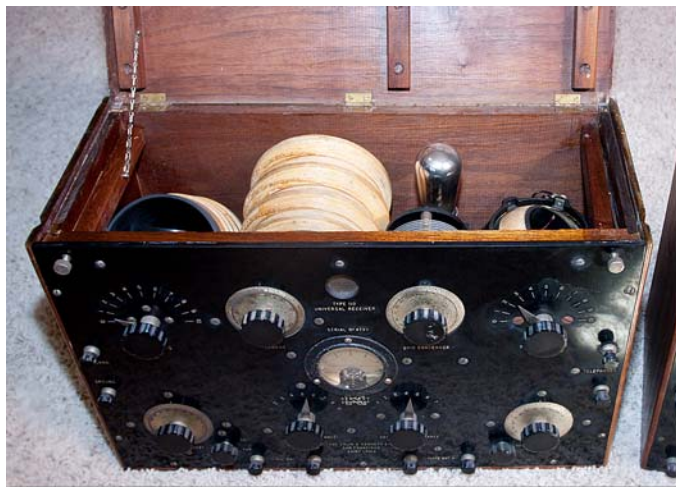
De Forest Mfg; New York, NY
Left: P-100 Audion Control Panel; 1919
Right: Type 201 Multi-Wave Tuner; 1920



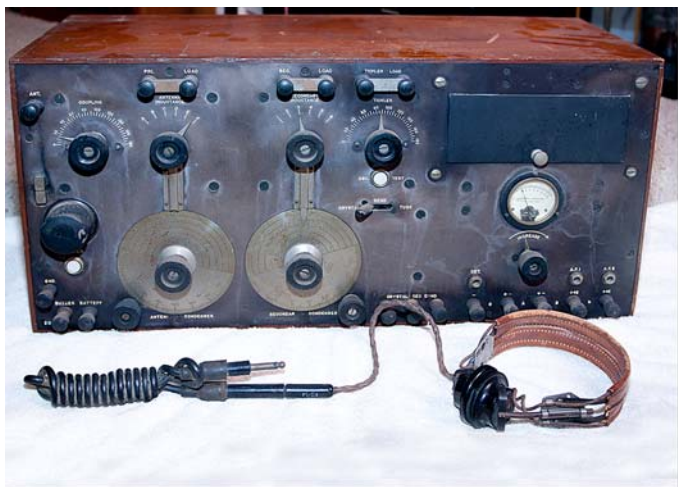
Colin B. Kennedy Co., San Francisco, CA
Model 281 shortwave receiver; 1921



Colin B. Kennedy Co., San Francisco, CA
Left: Model 110 Universal Receiver; 1922
Right: Model 525 Two-Stage Amplifier; 1922



Interior of the Kennedy 110 partially showing the large, precisely made coils. The coils are coated in yellow shellac.



RCA, made by Wireless Specialty Apparatus Co.
Type 1P501A receiver—amplifier; 1921; 300-8000 meters



Chicago Radio Laboratory, Chicago, IL
Model TR-1; serial no. 30; circa 1920
Chicago Radio Laboratory became Zenith Radio Corp

by David Ferrell Jackson

In the San Francisco in the 1950s and '60s, the KSFO call letters both literally and figuratively embodied the sound of the city. Known far and wide during that era as “The World’s Greatest Radio Station,” KSFO boasted a lineup of on-air talent perhaps unparalleled in broadcasting history, and as a result attracted a vast and devoted audience that — nearly thirty years after the original station’s departure — fondly remembers the magical moments spent tuned to the station.

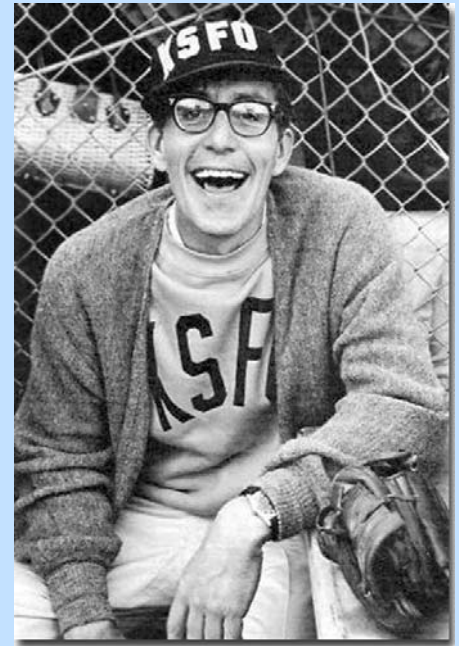
KSFO’s all-star lineup begins and ends with **Don Sherwood**, the San Francisco-born legend dubbed “The World’s Greatest Disc Jockey.” Born Daniel Sherwood Cohelan but known to his listeners as “Donnie Babe,” he broke into radio with brief mostly unmemorable stints at KFRC, KQW and KGO, then made a name for himself at Oakland’s KROW (960 AM) as part of the “Nick & Noodnick” morning team in the early 1950s.

With Sherwood as KSFO’s clean-up hitter, the station climbed from near-obscurity on the left-hand side of the dial to a spot on the dial that there were few reasons to tune away from, surrounded by *nonpareil* talent that included Al “Jazzbeaux” Collins, Del Courtney, Jim Lange, Herb Kennedy, Dave Niles, Wally King, Art Finley, Chet Casselman, Aaron Edwards, Bill Heyward, Lon Simmons and Russ Hodges.

And that lineup only takes us to about 1962!

Through the 1960s and into the 1970s, KSFO — from its ritzy digs atop Nob Hill in the Fairmont Hotel — built its dominance with an appealing mix of middle-of-the-road music and sports, including Giants baseball, 49ers football and, at various times, Cal and Stanford football and basketball, in addition to attracting even more talent, including Gene Nelson (formerly of KYA), Terry McGovern (from KDKA, Pittsburgh, Penn.), Dan Sorkin (a Chicago legend who stopped briefly at KFRC), Carter B. Smith (from KRE), Scott Beach, Norman Davis, Dick McGarvin, Rick Wagstaff, Bob Holmes and Russ “The Moose” Syracuse.

“Donnie Babe”



Don Sherwood in his KSFO No Stars uniform for a benefit softball game pitting the station's staff against local celebrities to raise funds for the Police Athletic League.



A generation of Bay Area sports fans grew up listening to the voices of Russ Hodges, Lon Simmons and Bill Thompson calling Giants baseball on KSFO in the 1960s

Born In A Church Basement

KSFO's rise to greatness began humbly in the basement of Oakland's Tenth Avenue Baptist Church in 1925, the dream of Rev. George W. Phillips. Using donations from his congregation, Rev. Phillips had the church's basement outfitted with two studios and placed a new 1000-watt Western Electric WE-106A transmitter on the upper floor, connected to a pair of 125-foot steel transmitting towers on the church's roof. The station received authority to operate from the Radio Division of the U.S. Department of Commerce and, at the request of Rev. Phillips, was assigned the very appropriate KTAB call letters.

On the evening of Saturday, August 1, 1925, before a live audience at the church and countless listeners throughout the Bay region, Rev. Phillips led KTAB onto the airwaves, broadcasting on a wavelength of 215.7 meters — what we refer to as 1390 kilohertz these days.

Less than a year later, a group of church members incorporated as The Associated Broadcasters (TAB) and leased the station from Rev. Phillips, who had mostly operated KTAB on Sundays, broadcasting his sermons from the church. Under the lease, KTAB embarked on a more ambitious programming schedule, adding music and other entertainment during the week, while continuing with its Sunday sermons.

With a subsequent growth in popularity, in 1928 KTAB's licensee became the property of the Pickwick Broadcasting Company, and moved into new studios at the co-owned Pickwick Hotel at Fifth and Mission streets in San Francisco. In November 1929, after being shifted to a variety of spots around the dial during the first four years of its life, KTAB settled in at 560 kilocycles, where it has remained for more than eighty years.



Rev. George Phillips broadcasts a sermon on Oakland's KTAB, forerunner of KSFO.



The KSFO staff poses before the station's new transmitter plant near Pier 92, circa 1937.

In the Summer of 1935, KTAB became KSFO, and on January 1, 1937, it became the San Francisco affiliate of the Columbia Broadcasting System. Later in 1937, KSFO finally abandoned its old original towers atop the Tenth Avenue Baptist Church in Oakland and began transmitting its signal from a new facility near Pier 92 and Islais Creek in San Francisco, with an increase of its daytime power to 5,000 watts.

Growing In The Golden West

In the 1940s, under the guidance of Wesley I. Dumm, KSFO made a bold effort to improve its standing among local stations, drawing up plans to build a new 50,000-watt transmitter plant near Novato, along with a proposed move to the 740 spot on the dial, in an attempt to retain its affiliation with CBS.

After a lengthy struggle, Dumm relinquished the plan, in essence “trading” the proposed facility improvements to CBS in exchange for affiliating his new television station, KPIX (Channel 5), with the fledgling CBS television network. CBS, in turn, would purchase KQW and convert it to powerhouse KCBS, using the blueprint developed for KSFO.

In February 1955, KSFO moved to the Fairmont Hotel, taking over studios previously utilized by KYA (1260 AM). Oddly enough, KYA subsequently moved to a suite of studios once used by KSFO at One Nob Hill Circle, adjacent to the Mark Hopkins Hotel.

In August 1956, Wesley Dumm and his partners sold KSFO to Golden West Broadcasters — owned by singing cowboy and budding media mogul Gene Autry and his business partner, Robert O. Reynolds — at which time KSFO began its dramatic ascent into the Bay Area radio stratosphere.



KSFO co-owners Wesley Dumm and Philip Lasky examine an architect's model of the station's new transmitting facility.

The Golden West era at KSFO marked a period of intense competition in local radio, as other stations battled to attract ears away from Don Sherwood and the other KSFO stars. Among the contenders were Doug Pledger and Frank Dill (KNBR), Jim Dunbar (KGO), Dave McElhatton (KCBS) and Van Amburg (KFRC, in the pre-Big 610 era, before Van become news anchor at KGO-TV). For the most part, the efforts were in vain.

On October 19, 1983, the FCC approved Golden West's sale of KSFO to Seattle-based King Radio Broadcasting for \$6-million. In a peculiar twist of fate, the one and only Don Sherwood passed away just a few weeks later, on November 4, 1983, at only 58 years of age. A month later, on December 13, 1983, King Radio took over control of KSFO, relocating it from the Fairmont Hotel to new studios at 300 Broadway in San Francisco, along with now co-owned KYA-FM (93.3 FM).

The archives of the Bay Area Radio Museum & Hall of Fame contain numerous recordings and other ephemera from throughout the history of KSFO, including tributes in audio, words and pictures to Don Sherwood and Al “Jazzbeaux” Collins, which are available online for your listening pleasure.

The KSFO Golden West Collection: <http://www.BayAreaRadio.org/audio/ksfo>

KSFO's Famous "Sound Of The City": <http://bit.ly/SoundCity>

The Don Sherwood Collection: <http://www.DonnieBabe.com>

Jazzbeaux' Purple Grotto: <http://www.PurpleGrotto.com>

◇

Author David Ferrell Jackson is the Executive Director, CHRS Bay Area Radio Museum & Hall of Fame.

Test of a von Lieben Tube

by Bjorn Forsberg and Mike Adams

On Sunday, February 25, 2012, Mike Adams was invited to witness an operational test by Bjorn Forsberg of a von Lieben tube in a replica Telefunken EV72 amplifier that he constructed. This article highlights Bjorn's preparation and findings for the test. But first some background.

Historical Background of the von Lieben Tube

By Richard Watts

At the same time Lee de Forest was developing his first Audion tube, there was a similar effort taking place in Germany. Austrian inventor Robert von Lieben (1878-1913) and Lee de Forest working independently are both credited with being among the first to patent a tube "device for amplifying feeble electrical currents." Superficially their devices bore similarities: they were contained in a glass envelope in a partial vacuum and each contained a small amount of gas deemed essential for proper operation. However, their designs were quite different. De Forest introduced the grid creating the triode Audion. Von Lieben, on the other hand, created a cathode ray device and controlled (deflected) the intensity of the beam reaching the anode with a magnetic field. For years the Audion was used primarily as a detector – not as an amplifier. Since Robert von Lieben was involved in telegraph and telephony, the von Lieben tube, also known as the LRS relay tube, was designed to principally as an amplifier to "relay" the message along in a telephone network.

The tube was in development for five years until 1911 evolving through many design changes. The tube was finally demonstrated in August 1911 at a Physical Chemistry conference in Berlin with representatives from AEG, Siemens, Telefunken and Felton und Guillaume in attendance. In 1912, these four German entities would form a consortium to commercialize the tube. Production began in 1913. The tube shown here (figure 1) is a production design circa 1913.

The von Lieben tube design is unique for its time. During initial development a magnetic ring was used to control beam intensity. In later designs electrostatic elements were used. A patent in 1910 describes the first use of an electrostatic grid and made references to the earlier work of De Forest. The tube was operated with positive grid bias. It employed an alkaline-earth emitter filament similar to that developed by Arthur Wehnelt in 1904.

The von Lieben tube is quite large with some designs towering 17 inches. In operation the tube is said to be spectacular: The bottom half glows red from the large oxide coated platinum filament; the top half fills with the sky-blue glow of ionized mercury vapor. Von Lieben tubes are among the rarest and are highly valued — its estimated only 25 good tubes exist. Per an Antique Radio Classified article, in 2003 a tube with a good filament sold at an Estes auction for \$14,500. Another tube with an open filament sold for \$7,000.



Figure 1: von Lieben Tube mounted in Bjorn's replica Telefunken EV72 amplifier. The tube is mounted in the RF adapter assembly.

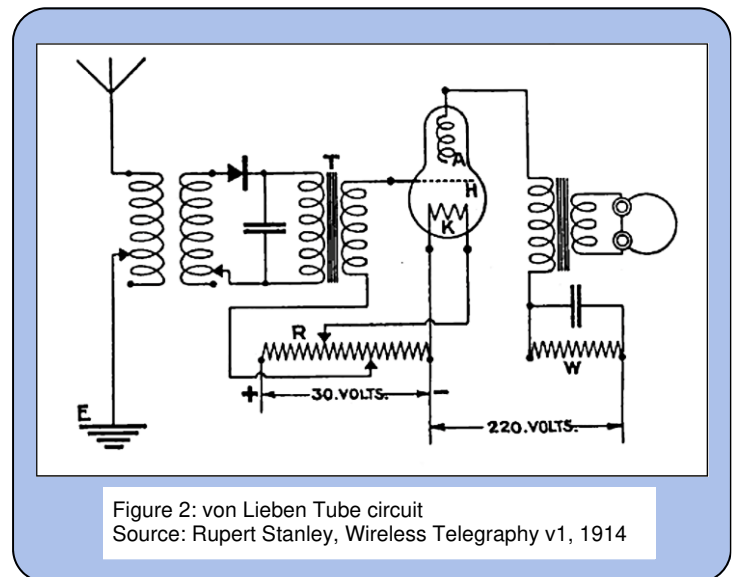
Test of the von Lieben Tube — Preparation and Findings

By Bjorn Forsberg

When I was lucky enough to become the owner of one of the early and rarest electron tubes, the von Lieben tube, I set out to make a working replica of the Telefunken EV72 amplifier. Fortunately, a couple of events helped. Dr. Franz Pischler from Austria published a book on von Lieben and had a presentation on the von Lieben history at AWA. Secondly, Bengt Svensson of Sweden arranged a loan from the Museum of Technology in Stockholm to the University of Electro-Communication (UEC) in Tokyo, of a von Lieben tube with an amplifier. That also included a very rare RF plug-in unit. Accepting the tube in Tokyo was Sash Ohtsuka, the famous tube collector, who had donated his large and fine collection to the University.

At the transfer ceremony in Stockholm, Bengt was able to get some very nice pictures of the so far unknown inside of the von Lieben amplifiers. My friend Sash made exact measurements of the amplifier, so I would be able to make a copy. With this material, I made a working replica of the Telefunken EV72 amplifier. It was not easy work to re-create history, because at the time of the Lieben tube there were no regular radio parts available, as the radio era came later. von Lieben had a telephone factory, so therefore he used mostly telephone equipment parts in his designs. Even the amplifier cabinet looks like an enlarged 1910 telephone. The electrical design of my replica comes from two sources. The first is from Pischler's book "Robert von Lieben" and the other is Rupert Stanley's "Wireless Telegraphy" from 1914 (figure 2), which has more intricate information on the amplifier circuit.

When my amplifier was completed using the original Lieben circuit, I found that my 1917 vintage tube EVN171 would not produce any amplification. That tube, among others, has the same unique socket as the von Lieben relay tube. The problem was that the Lieben unit uses some 28 to 32 V filament voltage and the grid bias was determined by a potentiometer across the filament. The EVN171 only has 3V filament voltage, but needs minus 4.5V grid bias, which made me go back to the old Vade-Mecum books for tube data for clues. I had also tried some 1920's tubes without any real success. By checking parameters in tube books, it became evident that I would need a separate grid bias source. I added a grid supply lead for the bias potentiometer on the top of the unit.



The original von Lieben amplifier descriptions points out the importance of the grid bias voltage, which was actually positive. With the new wiring, the EVN171 offered 14 dB of voltage gain and the European A415 and B415 showed 32 dB. The grid bias is very important and it will be interesting to see what it will do for the von Lieben tube, once I have the guts to crank the filament voltage up to 30 Volts at some two amperes.

The High Frequency Adapter

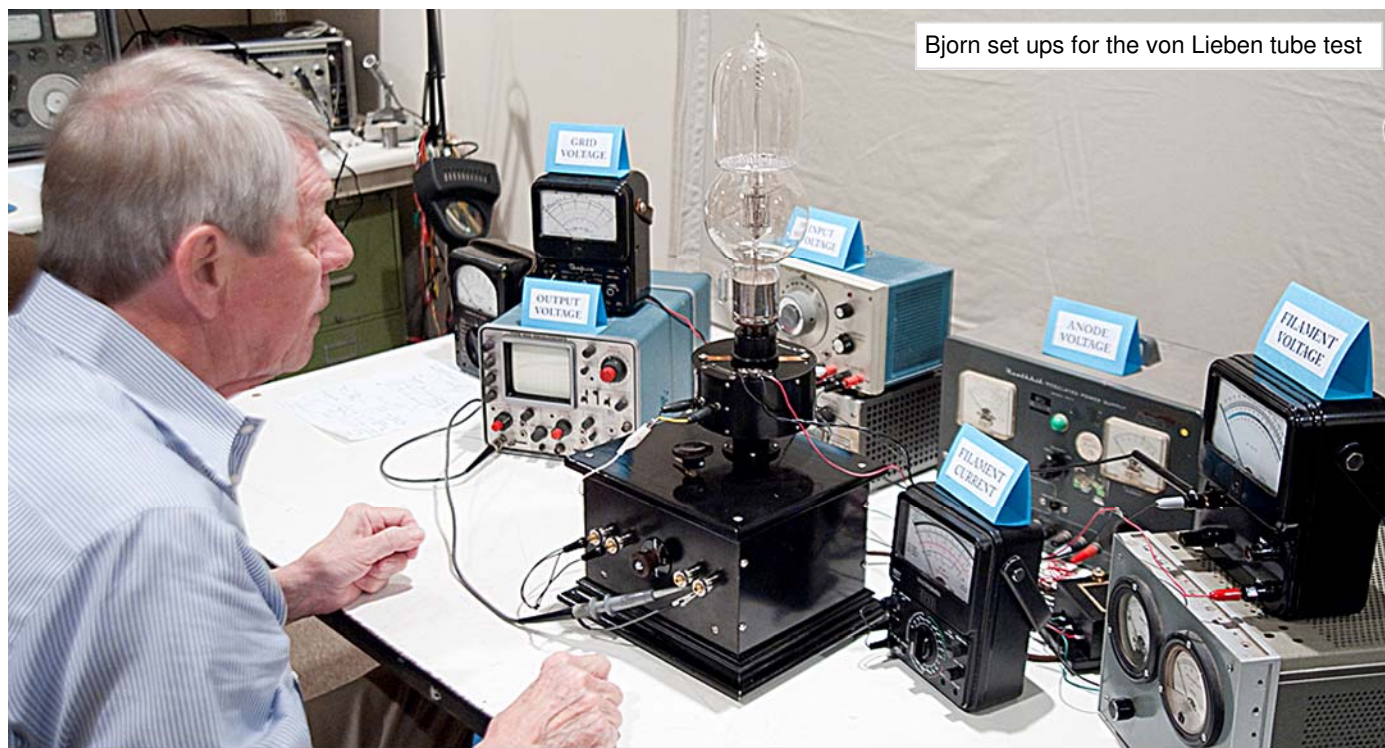
The next step was to make a replica of the RF plug-in unit. This one is called Zwischenstoepsel in German, which means "in-between connector." This unit plugs in between the tube and the amplifier box. There are no

RF parts inside and its only purpose is to provide connections to a tuned antenna input circuit and to a tuned crystal detector circuit at the output. Those circuits were connected to the banana plug receptacles on the round RF unit. Furthermore, it also has connection screws on the top of the unit for insertion of an adjustable resistor in series with the filament circuit. The filament is only supposed to glow with a dark red color, when used as RF amplifier.

With reference to the circuit diagram of my replica, the smaller capacitors are for RF bypass and the two larger are for audio frequencies. Stanley's book shows the use of a large resistor in the anode circuit. This can be understood, considering that the tube is based on mercury vapor, rather than hard vacuum and therefore probably has a low internal resistance. After all, it is supposed to have a blue glow with the anode voltage on. For the best RF amplification, the glow is supposed to be adjusted to a level of about 1-2 centimeters above the grid plate, according to instructions from 1913. This was adjusted with the grid bias potentiometer on top of the amplifier.

Findings from the Test

The first test occurred Sunday, February 26, 2012 and was made available for real-time viewing that Sunday via www.livestream.com/LRStube. The test should still be available for viewing.



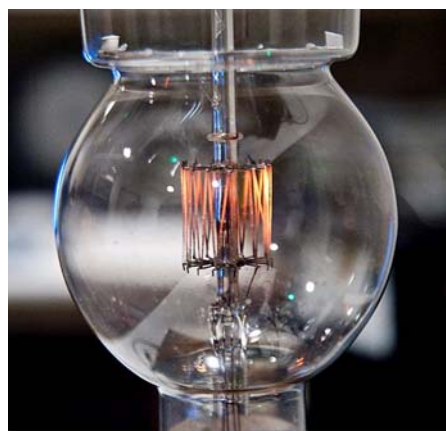
Test 1: In my first attempt to fire up the von Lieben tube and amplifier, my filament power supply did not have adequate voltage range to heat the filament correctly. It got up to 21 volts at 2.3 A, which is a high amperage judging from my research, but this tube seems to come from the Austrian Laboratory, rather than the Telefunken shop, where the tubes ran on 30V at 2A. The tube got warm but no visible filament glow. The filament current being much higher than anticipated also pointed to the possibility of a lack of vacuum because of gas in the tube. I also found that there was considerable filament voltage loss caused by my use of a vintage cable between the amplifier and the fuse box — it was my oversight not to check the equipment more thoroughly but will definitely use a viable power supply in future tests.

This test did not reveal any blue glow due to presence of the mercury vapor. I made another vacuum test with high voltage on the anode and I could only see some small blue discharges within the glassware risers to the grid and anode from the press which indicates there may be mercury vapor inside. After this first test, I have received encouraging notes from around the world with fine suggestions. My colleagues and I debated the present amount (or lack thereof) of vacuum. There are various tests for vacuum available which require additional instrumentation that I will be getting. I am also making a second working amplifier. Since its questionable that this tube is a viable specimen capable of producing the fine blue glow I'm also hoping in the future I can find another tube.



Bjorn and his von Lieben tube.

Test 2: On March 11th, a second test was conducted. A more capable power supply was used for the filament. As the filament voltage was slowly raised above 22 volts, the filament began to glow. In the streaming video with the camera switched to infra red, you could see the upper portion of the filament glow quite bright. Before the entire filament fully glowed, a diode shorted in the power supply and the fuse went. Up to that point, there was apparently not enough emission for the mercury vapor to ionize at 220 volts anode voltage with 15 volts on the grid.



Filament glow.

Test 3: Once the power supply was repaired, a third test was conducted March 18th. However, at about the same point in the experiment, the power supply once again failed in the same manner.

Test 4: On March 23rd, a fourth test was conducted with a stronger filament power supply. The filament was slowly raised to 30V with no indication of the blue glow. The filament voltage was then slowly raised to 35V. At that point, the anode voltage was 400V but there was zero anode current. The problem might be two-fold: The vacuum has diminished with time and that is maybe why the filament takes so much current. The production units used 2A at 30V and this one 3A at 35V. But this specimen was made in Austria and also an early unit. Secondly, I did not heat up the mercury amalgam further when we had reached 35V. That might be my next approach, if I intend to continue my quest of the holy tube grail. Another approach is to find another specimen, but these tubes are virtually unobtainable.

Even though his efforts have yet to produce the much anticipated blue glow, Bjorn's progress toward recreating history with this highly precious tube is both commendable and courageous. I want to thank Bjorn for sharing his experience with us and wish him every success in achieving the blue glow. — Editor

Bjorn Forsberg is an electronic engineer educated in Sweden. He immigrated to the United States in 1968. For most of his professional life he has worked in the space satellite and semiconductor business and is now semi-retired. He has been, and still is, an avid ham radio operator; he also collects antique radios and tubes. His main collection theme nowadays is Military radios from WWI. He lives in Los Altos California.

Photos taken by Mike Adams. Historical Background references are:

Gerald F. J. Tyne; Saga of the Vacuum Tube; (H.W. Sams & Co., 1977; Prompt Publications, 1994), pp 73-84
 Thomas H, Bridges IV; The Triode that Predated De Forest: Robert von Lieben and the LRS Relay Tube; (The AWA Review, Volume 5, 1990), pp. 45-62



The KFRC Western Electric 6B Transmitter Finds a Home with CHRS

by Steve Kushman

Recently I joined Paul Shinn, Scott Robinson and John Staples on an expedition into the Sierra Foothills to move the Western Electric 6B AM transmitter, that was in operation at KFRC from 1927 to 1935, back to the Bay Area. Sometime after it was removed from service at KFRC, it became part of Douglas Perham's collection. In 2003 the Perham Foundation Collection, including the WE 6B & 8B speech input equipment, was given to History San Jose. Last year History San Jose sold the equipment to former CHRS member Gary Halverson. Several months later it was sold to Mr. Nicholas Bergh of Southern California.

Mr. Bergh is using the WE 8B speech input equipment as part of a research project on early sound recording and reproduction. As the transmitter is not part of his research, Mr. Bergh generously offered to have CHRS be the caretakers of this significantly important piece of Bay Area radio history. We moved the transmitter into our El Cerrito storage until space can be made in the CHRS Museum at KRE for its display. CHRS is grateful to Nick Bergh and is proud to be chosen to preserve and present this rare Western Electric transmitter.

Photos of this transmitter in service at KFRC appear in Bay Area Radio, a new book from John Schneider and CHRS (see page 35). ♦



Transmitter bays are very heavy. We took a lesson from the Egyptians and rolled it on pipes.

The Western Electric 6B Transmitter

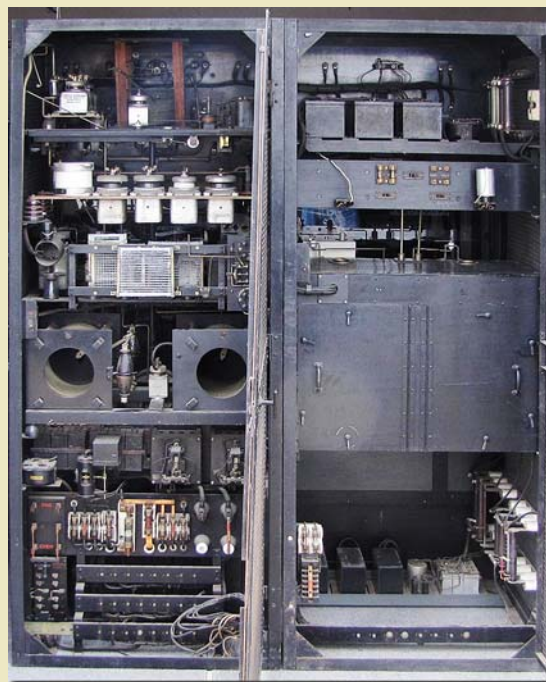


Left: Exciter bay

The WE 6B is a 1000 watt AM transmitter. It consists of two bays: an Exciter bay, and Power bay. The Power bay uses a 276 tube, two 212E triodes and a 328 water-cooled final amplifier tube. Below the tube access door are the 3rd Amplifier, Antenna Tuning, and Power Amplifier Tuning controls. The bottom row controls the three motor-generators used to supply 24VDC (filaments), 250VDC (grids) and 4000VDC (plate). The motor-generator sets were normally located in a separate room.

The Exciter bay is designed for two crystal oscillators (one as primary, a second as backup). Our bay only has one. On the rear deck are two stages of RF amplification employing two 242C triodes.

Reference: kjq.us.com



Left: Power bay

Right: Exciter bay

“Secret Weapon” for Chassis Cleaning

by Thomas Bonomo, K6AD

I'd like to share with you my “secret weapon” for cleaning dirty radio chassis. Like many restorers, I'm not a fan of the “dishwasher method”, so I used to clean chassis the hard way^¾rubbing with a rag, a Q-Tip, or a soft brush dampened with some cleaning product. The results were usually only marginally satisfactory. Even using brushes, I was often unable to remove the accumulated crud from tight areas. The chassis looked noticeably better, but never like new, and there was always the risk of ending up with that dreaded “rubbed” look.

I have seen many, many chassis permanently marred by an eager restorer who supplants an inadequate cleaner with generous amounts of elbow grease, leaving behind swirls and a “rubbed” look. Fellow collectors have suggested many cleaners, and I've tried them all — *Simple Green*, 409, *Windex*, ammonia, etc. These cleaners work to varying degrees, depending on the type of dirt to be removed.

There is, however, another type of cleaner from the automotive field that I've found to be far more effective. This product is “*Super Clean*” and made by Castrol. It is based upon a new chemistry in cleaners and instantly solubilizes oil, grease, and dirt and, most importantly, brown nicotine. Its not just another soap-based cleaner; yet is biodegradable and phosphate-free.

Here is the best way to use *Super Clean*, along with a few cautions. First remove all the tubes, then spray the chassis with *Super Clean*. Avoid getting any liquid into IF cans or transformers, or onto dial scales and painted surfaces. The idea is to get the cleaner only on the chassis. Within seconds, rivers of dirt and nicotine will begin to run off — even from around tube sockets, screws, and rivets that would otherwise require rubbing and brushing. Use a small brush to quickly and lightly go over all surfaces to loosen thicker accumulations of crud. After no more than one minute, rinse the chassis thoroughly with water (avoid getting water in the IF cans and transformers) and let the chassis dry for several days before applying power.

A few words of caution. *Super Clean* is strong stuff. First, dilute the off-the-shelf product 50% with water. A 50% solution is strong enough to produce the result you want. Second, keep it away from painted surfaces (like the front panel) except for short periods. You don't want streaking. Third, do not leave it on the chassis for more than one minute. If you must contend with painted surfaces or silk-screened tube designations on the chassis, test a hidden painted spot before proceeding. Some paints are harder than others. Following these guidelines, I have never had a problem, and I've probably cleaned at least eighty radios.

To help protect the chassis from tarnishing and corrosion after it has been cleaned, spray on a thin coat of silicone. Use water-based silicone (often referred to as food-grade silicone) rather than a petroleum-based product, which can attack rubber and some plastics. A commonly available water-based silicone is *LPS Heavy-Duty Silicone Lubricant*.

If a chassis is not permanently rusted or tarnished, this cleaning technique can often make a brown, nicotine-coated chassis shine like new. Collectors have looked in amazement at some of my “*Super Cleaned*” Collins amateur radios, thinking that they were new. Corrosion has never been a problem with this cleaner, either. Just flush the chassis well with water. Radios I cleaned back in 1996, including a Collins KW-1 transmitter, still work like a charm. Try this experiment yourself: clean a chassis with *Simple Green*, and then watch the rivers of brown flowing off the chassis during a subsequent *Super Clean* treatment. You'll be amazed. *Super Clean* is available at most automotive stores and chains like Wal Mart. *Simple Green* and my other cleaners have now been relegated to more mundane tasks such as cleaning floors and toilets. ♦



Québec Canada and the CHRS Restoration Contest

by Gilles Vrignaud

You may ask, what does Québec have to do with a CHRS contest?

It started nine years ago when the Société Québécoise des Collectionneurs de Radios Anciens (SQCRA) decided to hold a restoration contest. The idea was to start with a basket case radio and restore it to its original condition. Points were assigned for several categories (more on this later) and a yearly winner was declared.

Over the last nine years, the SQCRA members have refined the contest and achieved some remarkable restorations. Based on their experience, they thought it would be interesting to open the contest to any club in the world via Internet judging. Of course we accepted the challenge and very soon found ourselves with several contestants, hence the **CHRS Restoration Contest**.

The contests will run on a yearly basis. Our first one has launched in February 2012 and will end in December. Our winner will be submitted to the SQCRA for the international contest at the end of the year (date TBD).

CHRS judges will use a 0 to 10 scale for each of the following categories adapted from the SQCRA scoring:

Initial Condition score — 30 points

- 1) Initial condition /appearance of the cabinet;
- 2) Initial condition / appearance of the chassis and wiring;
- 3) Difficulty of electronics repair.

(Note: A truly basket case radio could earn up to 30 points initially)

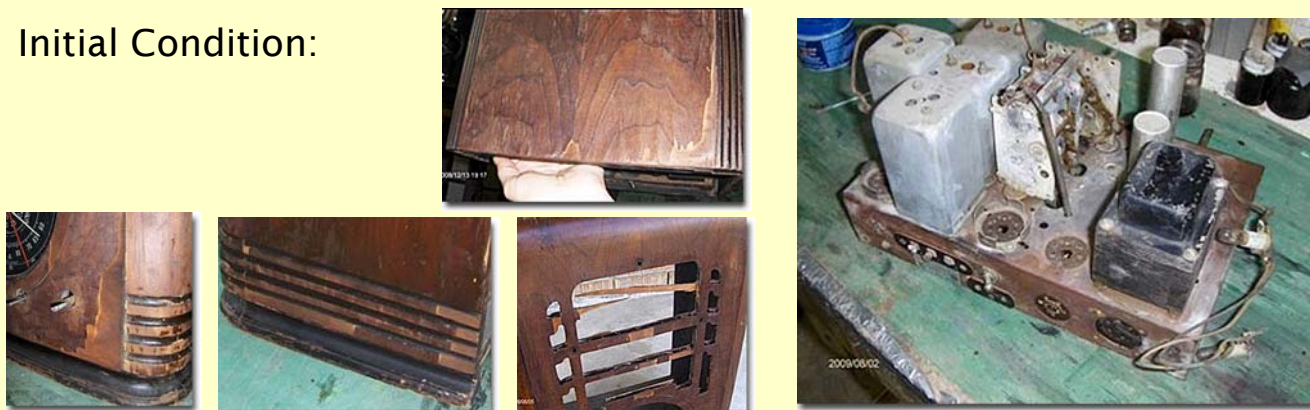
Restoration score — 70 points

- 4) Quality of cabinet restoration (cabinet, dial scale, back panel, matching knobs, etc.);
- 5) Quality of chassis cleanup and restoration (rust removal, plating, decals, etc.) ;
- 6) Quality of wiring and repair work;
- 7) Authenticity of materials used;
- 8) Audio performance (loudness, fidelity) as appropriate for the year and model;
- 9) RF performance, (sensitivity, selectivity) as appropriate for the year and model;
- 10) Detail of documentation of the “during” process.

Total score possible — 100 points

An example is this Zenith 5S128 shown with permission from 2008 winner, Daniel Gervais:

Initial Condition:



After Restoration:



Since the radios cannot be physically entered to the international contest, it is strongly recommended that contestants take great care to document all the steps with photos and text, in .pdf format for submittal to SQCRA. A short Movie file (< 2 minutes) would definitely enhance the submittal.

All the submissions will be aggregated by SQCRA, and re-distributed to each club for Internet judging. Each participating club has one judge who will judge all the submissions except the one from his own club.

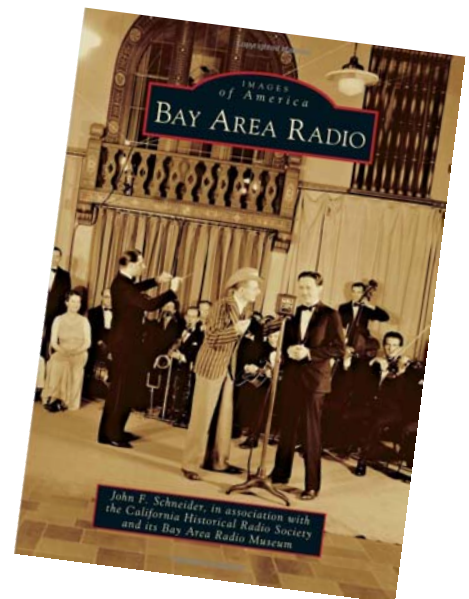
SQCRA will tally all the results, and the winner will receive a prize from each of the participating clubs.

Clubs as far as New Zealand are participating; so let's show them what California can do! ◇

Bay Area Radio

A new book from John Schneider and CHRS

Radio historian John F. Schneider and the California Historical Radio Society have assembled a collection of rare photographs that document the artistry and technology of this important aspect of San Francisco's history. The San Francisco Bay Area was a key national radio broadcasting center during the first three decades of commercial radio. In 1909, it was home to the very beginnings of the art and science of broadcasting, when Charles D. "Doc" Herrold began sending out weekly voice and music programs from his Wireless and Engineering College in San Jose. Dozens of other radio pioneers soon followed. In 1926, big broadcasting came to San Francisco when the newly formed National Broadcasting Company (NBC) established its West Coast headquarters on Sutter Street. Other national and regional networks soon set up their own broadcast production centers, and for the next 20 years, thousands of actors, musicians, announcers, and engineers were creating important programs that were heard on the West Coast as well as nationwide. During World War II, San Francisco became the key collection center for Pacific war news, and bulletins received in San Francisco were quickly relayed to an anxious nation. Conversely, powerful shortwave stations broadcast war news and propaganda back to the Pacific and entertained American troops overseas. ◇



Available at the CHRS Museum Store

